THE FIELD OF HELIOSTATS at the National Solar Thermal Test Facility at Sandia has been in use with the original equipment for more than 30 years. An upgrade of the heliostat controls, both software and hardware, is under way. The field will be shut down for approximately six months while this upgrade is completed. *Lab News* photographer Randy Montoya captured this photograph of the heliostat field just at sunset on a recent fall day. (Photo by Randy Montoya)

Bridging two worlds

Sandia Security Police Officer Thelma Holman crafts the clay of her home village — Jemez Pueblo — into objects of beauty and power. On a recent Jemez feast day, Thelma and her mother Juanita Yepa, a Sandia retiree, talked about their art with *Lab News* photographer Randy Montoya and editor Bill Murphy. Story and photos on **pages 6-7**.

Sandia LabNews

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Sandia National Laboratories

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Sled track accident galvanizes Sandia to move forward on safety in the workplace

ACCIDENT SCENE — This photo, from the NNSA Type B Accident Investigation Board report, is one of several photos used to depict conditions at the scene of the Oct. 9 sled track accident. The report identifies this image as "Representative rocket motor and test package."

By Bill Murphy

The Oct. 9 accident at Sandia's 10,000-foot sled track that resulted in a contractor suffering a broken leg and burns was "preventable," an NNSA investigative board has found. The board, established by order of NNSA Sandia Site Officer acting manager Kim Davis to investigate the accident, spent a month going over the circumstances surrounding the incident. The board members were all NNSA employees; no Sandians sat on the board, though a Sandia technical advisory team headed by Anthony Medina (2500) aided the board in its work.

"That's the value of having an external group look at your operations. They see things in a new way."

— Div. 4000 VP Mike Hazen

The NNSA investigation board report, made available to the public on Nov. 18, asserts that Sandia "did not provide sufficient oversight of the sled track operations to ensure that requirements were appropriately implemented."

(Continued on page 4)

Ion Beam Laboratory

Sandia will soon break ground for the new Ion Beam Laboratory. The IBL facility replaces a "temporary" building erected 53 years ago. The unique structure will contain six accelerator systems to generate heavy and light ions. Story on **page 4.**

Inside . . .

Shoes for Kids

For more than 50 years, Sandians have been supporting the Shoes for Kids program, which provides new shoes for needy children. Sandians who have helped with shoe fittings never forget the experience. Story and photos on **page 12.**

That's that

On the way to work today, I saw something I thought I'd never see again: gasoline at $1.75 a gallon. Along with probably just about everybody else in the country, I figured we had officially entered the era of $4 gas. All the indicators reinforced the view.

The "end of oil" movement has argued pretty convincingly that all the cheap and easy-to-get-to oil had already been got and that in the years ahead, oil is just going to get harder and more expensive to extract. Combine that fact with the surging demand for oil from the likes of India and China and the unwhettable appetite for oil right here at home and you have a recipe for a remorseless, inexorable increase in fuel costs. Or so it seemed. But light, sweet crude (doesn't that sound delicious, like maple syrup or something?) was trading at less than $50 dollars a barrel this morning, down from a peak of $147 just a few months ago. Oil has collapsed even more radically than my poor little 401(k).

So, with cheaper gas and an economy in recession we can quit worrying about investing hard-to-come-by federal dollars in alternative energy, energy independence, and all that, right? Well, no. No matter how you cut it, we still get an inordinate amount of our oil from nations that are not exactly on friendly terms with us. And even if gasoline is less than two bucks a gallon today, you have to figure it'll be back up there in the stratosphere sooner rather than later.

As a nation, we need to continue to push for innovative energy solutions, an area where Sandia can be a major contributor. As Margaret Thatcher said to President George H.W. Bush at the beginning of the 1991 Gulf War, "This is no time to go wobbly."

* * *

Do you PowerPoint? If you do, you might get a kick out of something Tim Spears (5097) sent me the other day. It's pretty funny, but funny in a way that makes you stop and think and maybe even examine your own work habits a little bit. It's a link to a website (www.norvig.com/Gettysburg) that shows how the Gettysburg Address would come off if it were done today as a PowerPoint presentation. The bullet points on the summary slide are: • *New nation* • *Civil war* • *Dedicate field* • *Dedicated to unfinished work* • *New birth of freedom* • *Government not perish.*

Loses something in the translation, doesn't it?

If you dig a little deeper into the website I cite above, you'll find that the guy who created the presentation isn't some sort of latter day Luddite, an antitechnology curmudgeon who thinks the last good idea was, like, 200 years ago. Not at all. The creator happens to be Peter Norvig, director of research at Google (and previously head of computational sciences at NASA and a faculty member at USC and Berkeley).

As well as being a manifestly brilliant scientist, Norvig must be a very funny guy. Here's how he starts that Gettysburg presentation, which strikes me as pitch-perfect: "And now please welcome President Abraham Lincoln" . . .

"Good morning. Just a second while I get this connection to work. Do I press this button here? Function-F7? No, that's not right. Hmmm. Maybe I'll have to reboot. Hold on a minute. Um, my name is Abe Lincoln and I'm your president. While we're waiting, I want to thank Judge David Wills, chairman of the committee supervising the dedication of the Gettysburg cemetery. It's great to be here, Dave, and you and the committee are doing a great job. Gee, sometimes this new technology does have glitches, but we couldn't live without it, could we? Oh, is it ready? OK, here we go . . ."

Tim says his wife suggested that Winston Churchill's famous "Fight them on the beaches" speech would make for a terrific PowerPoint. It might go something like this: ". . . . *beaches* • *landing grounds* • *fields* • *streets* • *hills.*"

Says Tim: "Just think how many great speeches could be reduced to bullets and turned into PowerPoint slides . . . Proof that PowerPoint may be the undoing of civilization." No argument from me, Tim. Not at all.

See you next time.

— *Bill Murphy (505-845-0845, MS0165, wtmurph@sandia.gov)*

Jeff Quintenz honored by University of Arizona Alumni Association

Recognized with Professional Achievement Award

Jeff Quintenz (4800) has been honored with the Professional Achievement Award from the University of Arizona Alumni Association.

JEFF QUINTENZ (4800) displays the Professional Achievement Award plaque presented to him in late October by the University of Arizona Alumni Association.

Jeff, director of Facilities Management and Operations Center 4800, earned two electrical engineering degrees from the University of Arizona: a BS in 1971, when he graduated at the top of his class and was named the outstanding senior in the College of Engineering, and a PhD specializing in electromagnetic analysis in 1975.

After joining the technical staff at Sandia and holding a series of increasingly responsible positions in the area of pulsed power, Jeff left the Labs in 2004 to serve as president of Lockheed Martin Nevada Technologies and deputy general manager for the Stockpile Stewardship Program and operations of Bechtel Nevada. In 2006, he returned to Sandia, where he assumed his current position.

Jeff has authored or coauthored more than 80 publications and more than 150 technical presentations.

Jeff is a fellow of the Institute of Electrical and Electronics Engineers and a member of the American Physical Society and the American Association for the Advancement of Science. He is past associate editor of the journal *Laser and Particle Beams*, and has served on the College of Sciences Board of Visitors at Washington State University and on the College of Engineering Dean's Advisory Committee at the University of Missouri-Columbia.

Our HeaRts Warm Kids Feet

Human Resources Center 3500 invites everyone to join in supporting the Shoes for Kids program by donating socks for children in grades K-5 via the Our HeaRts Warm Kids Feet drive. Any children's size (age 5-10) in any color or design for both girls and boys is welcome. Leave socks in the "sox boxes" in Bldgs. 800S, 856, or in IPOC Rm. H1508, Dec. 2-12. While you're out shopping this holiday season, remember the little feet you can help keep warm and dry. Questions to Kim Goodrich (3554-3) at 505-845-7150 or kjgoodr@sandia.gov. (For more on Shoes for Kids, see page 12.)

Sandia LabNews

Sandia National Laboratories

http://www.sandia.gov/LabNews

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Bill Murphy, Editor 505/845-0845
Chris Burroughs, Writer 505/844-0948
Randy Montoya, Photographer 505/844-5605
Mike Janes, California site contact 925/294-2447
Michael Lanigan, Production 505/844-2297

Contributors: John German (844-5199), Neal Singer (845-7078), Stephanie Holinka (284-9227), Iris Aboytes (844-2282), Michael Padilla (284-5325), Julie Hall (284-7761), Patti Koning (925-294-4911), Michelle Fleming (Ads, Milepost photos, 844-4902), Dept. 3651 Manager Chris Miller (844-0587)

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Recent Patents

Note: Patents listed here include the names of active Sandians only; former Sandians and non-Sandia inventors are not included. Following the listing for each patent is a patent number, which is searchable at the US Patent and Trademark Office website (www.uspto.gov).

* * *

Ron Renzi (8125), Karl Wally (8226), Bob Crocker (8125), James Stamps (8229), Stewart Griffiths (8300), Julie Fruetel (8125), Isaac Shokair (8123), Daniel Yee (8224), Victoria Vandernoot (8621), and Scott Ferko (8136): Portable Apparatus for Separating Sample and Detecting Target Analytes (Patent No. 7,452,507)

Ratish Punnoose (8229): Compact Low Frequency Radio Antenna (Patent No. 7,450,081)

James McElhanon (1821) and Tim Shepodd (8778): Detection of Electrophilic and Nucleophilic Chemical Agents (Patent No. 7,449,579)

Retiree deaths

Note: This list of retiree deaths for the month of August 2008 was inadvertently omitted from a previous issue of the Lab News.

Robert L. Manhart (age 77) . . . . . Aug. 2
Johnny Otero (69) . . . . . Aug. 2
Luther L. Rivera (77) . . . . . Aug. 9
Mary E. Fischer (84) . . . . . Aug. 13
Ruth A. Beardsley (83) . . . . . Aug. 16
George T. Mancuso (86) . . . . . Aug. 16
John D. Coleman (81) . . . . . Aug. 25
Osborne Milton (87) . . . . . Sept. 27

Cell analysis platform now available for licensing, partnerships

By Mike Janes

Fully developed research tool supports rapid, precise, efficient, and multiplexed analysis of individual cells, providing a systems-level understanding of cellular behavior.

Sandia is seeking commercial partners to license or contribute to the continued development of a new lab-on-a-chip platform for high-throughput manipulation and interrogation of individual cells, one that enables quantitative analysis of cellular behaviors with unprecedented speed, resolution, sensitivity, and multiplexing.

The Microscale Immune and Cell Analysis (MICA) platform is a tool designed to facilitate study of a wide variety of cellular processes. It has consistently demonstrated its value in initial applications at Sandia, which have focused on elucidation of immune cell responses to potentially deadly microbial pathogens.

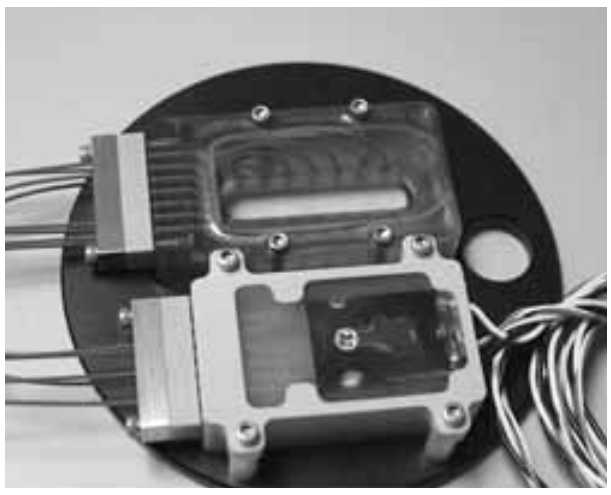
MICA integrates cell culture and handling, cell stimulation (e.g., introduction of a pathogenic challenge), fluorescence-activated cell sorting (FACS), flow cytometry, high-resolution imaging, and antibody-based proteomic analysis. All experimental manipulations are carried out at the microscale and are fully automated, providing precise control over each cell and its environment. The closed-system format lends itself well to applications in which containment is desirable (e.g., work with dangerous pathogens). Moreover, because microscale experiments consume vanishingly small amounts of cells and reagents, MICA can be used to investigate cellular processes that have proven impossible or impractical to study at conventional scale.

MICA, its developer say, offers a broad array of benefits over alternative approaches:

• ***Better measurements***. Scaling advantages of microchannels provide unprecedented temporal (millisecond) and spatial (micrometer) control over cell environments, and MICA's systems integration and automation eliminates manual steps and the errors associated with them.

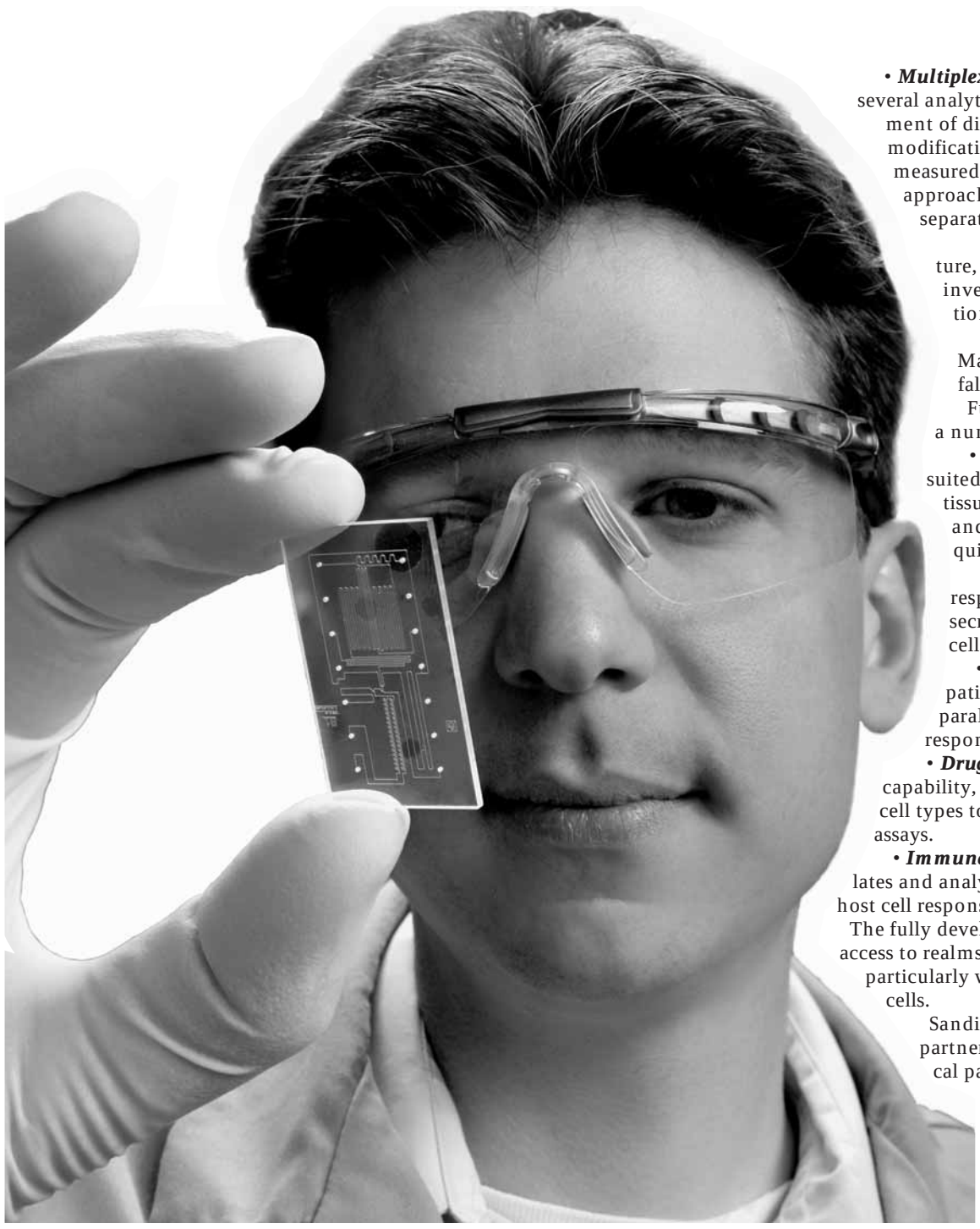
• ***Faster, more efficient measurements.*** Researchers can use MICA to measure multiple cellular events rapidly and in parallel, without requiring large quantities of cells and expensive reagents.

• ***New measurements.*** MICA offers the opportunity to perform experimentation and measurement at single-cell resolution, which is not possible using conventional FACS or proteomic techniques.



SINGLE-CELL ARRAY — This section of the MICA platform shows the top and bottom of a single-cell array and cell sorter that are mounted in a microscopic plate.

Sandia CaliforniaNews



• ***Multiplexed measurements for systems understanding.*** MICA integrates several analytical techniques in a unified platform, enabling parallel measurement of different types of cellular events (protein expression, localization, modification, and interaction). Consequently, correlations between measured events may be observed directly, whereas with conventional approaches such correlations must be inferred from the results of separate experiments.

• ***Versatility.*** MICA's modular format, flexible platform architecture, and convenient packaging (compact footprint fits any standard inverted microscope stage) greatly facilitates operation and dissemination to other laboratories.

"The promise of MICA is immense," says Glenn Kubiak (8600). Many of the lab tools used today to study cellular behavior, he says, fall short in speed, throughput, ease, and selectivity.

Full development of MICA, Glenn says, should enable advances in a number of fields of interest:

• ***Diagnostics.*** The microfluidic-based platform of MICA is well suited for analysis of small, precious clinical samples (e.g., primary cells, tissue biopsies). Even rare cells may be selectively isolated (via FACS) and analyzed (via flow cytometry, imaging, and/or immunoassay) quickly and efficiently.

• ***Biomarker discovery.*** MICA enables identification of complex response profiles through precise quantitation of the expression, secretion, modification, and interactions of proteins in individual cells.

• ***Personalized medicine.*** Multiple cell types, drawn from a single patient or from different patients, may be individually analyzed in parallel for extended periods of time to assess the specificity of response to a given treatment.

• ***Drug discovery and therapeutics.*** With its multiplexed screening capability, MICA enables quantitative analysis of the responses of multiple cell types to multiple drug candidates in high-throughput, highly parallelized assays.

• ***Immune and infectious disease.*** The precision with which MICA manipulates and analyzes cells enables capture of even the most rapid and transient host cell responses to pathogens.

The fully developed MICA platform, Glenn predicts, will provide unparalleled access to realms of biological research that are only now beginning to be explored, particularly with respect to systems-level analysis of the behavior of individual cells.

Sandia's business development team is currently soliciting commercial partners. Additional information on MICA, including fact sheets, technical papers, and information on partnering with Sandia, can be found at www.ca.sandia.gov/mica/.

MICA PLATFORM — A unique lab-on-a-chip tool, MICA enables researchers to precisely target, sort, and measure samples as small as a single cell in an automated system that includes flow cytometry. Here, Sandia researcher Thomas Perroud examines a MICA chip. (Photo by Randy Wong)

Sled track

(Continued from page 1)

Deputy Labs Director Al Romig and Div. 4000 VP Mike Hazen say the accident — and the subsequent NNSA report — offer Sandia a unique opportunity.

"That's the value of having an external group look at your operations," Mike says. "They see things in a new way." The report, he says, is "very revealing, and in some cases sobering."

Al says the report — along with insights Sandia is gathering under several processes it has launched independently — provides an opportunity to improve safety in the workplace.

Among employees, there has been heightened interest in workplace safety in the wake of the sled track accident, Al says. The Labs should leverage that interest. "We need to make sure we don't let that passion for safety fade," he says.

The accident board's report requires certain specific responses from Sandia to mitigate the risk of a similar accident occurring in the future. Sandia, though, began acting long before the NNSA investigative team issued its report.

Al notes that Sandia's response was "immediate and multifaceted." Among the measures commenced in the hours and days immediately following the sled track accident were:

• In his capacity as VP for Infrastructure Operations, Mike Hazen started an immediate investigation, handing off that role to the NNSA board when it was formed.

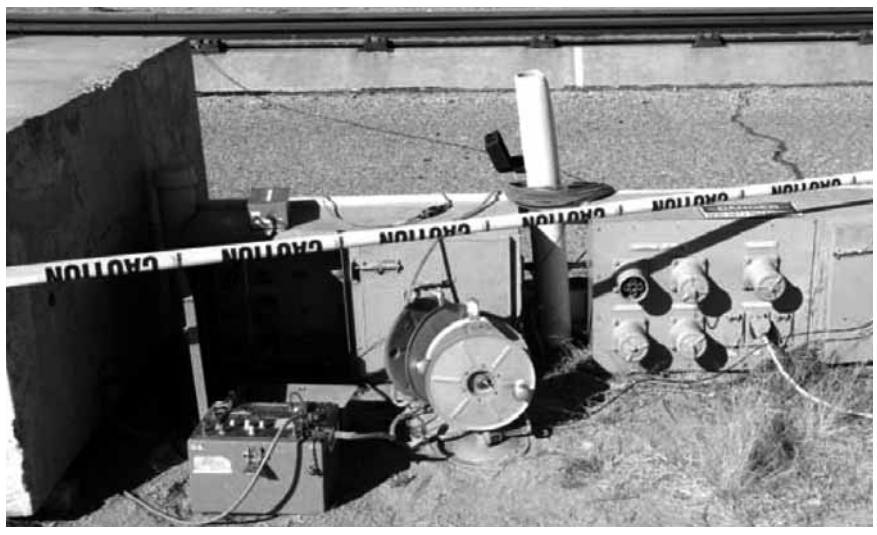
• There was a Chief Operating Officer/management-ordered pause in the Labs' energetic materials work. A rigorous restart process was defined, one that involves VP (and sometimes EVP) approval. That process is underpinned by an internal review board that analyzes the issue.

• Labs Director Tom Hunter communicated the importance of the issue in an email memo to all hands. In that memo, he outlined measures the Labs was already taking and emphasized Sandia's uncompromising commitment to a safe workplace.

• Tom and Al conducted an all-hands meeting on safety that was webcast to the entire Labs population.

• Sandia established an external review board that is up and running. That board's charge is to look beyond the sled track accident to the larger issue of safety in the workplace. The internal chair is Div. 2000 VP Steve Rottler. The external chair is retired US Navy Rear Adm. Walter Cantrell. Cantrell headed NASA's Return to Flight Task Group. He also headed the space shuttle Columbia accident review board. The Sandia-established external review board also includes a number of the nation's top workplace safety experts. The group is charged to present to Labs management before the end of the year a list of actionable items related to workplace safety.

• Every department in Sandia conducted a dedicated safety meeting; each group was charged to talk frankly about safety issues, the Labs' safety culture, and obstacles to a safer workplace. Feedback from those meetings has been submitted to a review team that is consolidating the recommendations into actionable items.



THE NNSA TYPE B accident investigation board secured the site of the Oct. 9 sled track accident as part of its process to gather forensic evidence related to the incident. The board's report was issued on Nov. 18. (Photo from official NNSA accident investigation board report)

"The nation and all Sandians have every reason to expect that we will perform our work safely. It's absolutely essential that we live up to that expectation, that we recommit ourselves and rededicate ourselves to making Sandia a safer place."

— Deputy Labs Director Al Romig

The sled track accident, Mike says, highlights the fact that the very heart of the ILMS system — the Corporate Work Process (CWP) and its familiar five-pointed star — represents the essential — and official — approach for ensuring workplace safety. The five points in the CWP star (as well as the related Integrated Safety Management System star) are: plan work; evaluate risk; implement controls; perform work; and improve process.

The NNSA accident report cited several instances in which at least some of the CWP processes were not fully implemented in the circumstances that resulted in the sled track accident.

While the ILMS/CWP/ISMS processes are the very foundation of how work is done at Sandia, both Al and Mike agree that ultimately, safety is the responsibility of each individual member of the workforce. And that is where Al says he'd still like to see a further advance in Sandia's safety culture.

In the nearly 30 years that he's been at the Labs, Al says he's seen real growth among employees regarding safety — at the intellectual level. What he'd like to see today, Al says, is a more visceral, internalized, even gut-level appreciation that safety is absolutely paramount to the Labs' overall success. "It's the bedrock of everything we do," he says.

Mike, who's been at the Labs for just over four years, says he's noted an increased awareness of safety matters — accompanied by demonstrably improved safety performance — even in that relatively short timeframe.

"There's no question," he says, "that we've suffered a setback; we've lost a little bit in the eyes of others who hold us up as a model of excellence. We'll get that respect back; we'll earn it."

"The nation and all Sandians," says Al, "have every reason to expect that we will perform our work safely. It's absolutely essential that we live up to that expectation, that we recommit ourselves and rededicate ourselves to making Sandia a safer place."

Sometimes, Al adds, a tragic event (such as the sled track accident) can be "a unifying experience, one that inspires us to pick ourselves up and move forward."

In the weeks and months ahead, the *Lab News* will continue to report on specific responses to the findings of the NNSA investigative board and to action items proposed by the external safety review board.

Ground to be broken for new Ion Beam Laboratory

'Temporary' original structure lasted 53 years before replacement

By Neal Singer

A 15,000-square-foot building in Tech Area 1 erected in 1956 for $150,000 and currently housing important experimental equipment worth millions of dollars will give way to a 27,000-square-foot structure to be built northeast of the Process and Environmental Technology (PETL) building, at a total project cost of approximately $39.6 million.

This figure includes constructing and equipping the new building, relocating personnel and existing equipment, and demolishing the old building.

Groundbreaking for the new Ion Beam Laboratory is scheduled for Dec. 16.

The building will include 20,000 square feet of high bay for research and 7,000 square feet for offices. The unique structure will contain six accelerator systems to generate heavy and light ions ranging from one electron volt to 400 million electron volts.

One eV is enough to energize a single photon; 400 MeV will accelerate particles to 7 percent of the speed of light.

The beams will be used for nuclear weapons programs, ion beam analysis, and radiation effects testing, as well as basic research and development, LDRD work, and work for others.

"In this time of significant federal budget constraints, we are very appreciative that this critical capability has been given national priority," says Joan Woodard, Executive VP and Deputy Labs Director for Nuclear Weapons (002).

The old building, which topped the Labs' priority list for replacement, is described by longtime occupant and building contact Barney Doyle (1111) as "resembling a grain elevator" in construction materials and style.

A sheet-metal-roofed building emblematic of the spartan style of the early, post-World War II Sandia, it was originally used as a photo lab and to fold parachutes.

ARTIST'S RENDERING of Sandia's new Ion Beam Laboratory.

Nevertheless, it became the site of research that generated impressive national recognition.

Among testaments to the superior work accomplished there by a staff of (usually) seven were a 1990 E.O. Lawrence award (Tom Picraux), nine Basic Energy Sciences awards, five R&D 100 awards, 17 patents, and more than 1,300 scientific publications.

Still, says Barney, "[Bldg. 884] was intended as a temporary building. We've outgrown it spacewise and you can imagine the condition: roof leaks, floods, impacted science equipment."

The cost of maintenance, possibility of increased downtime, insufficient radiation shielding in the crowded space for today's more powerful beams, as well as potential insufficient beam stability when under scrutiny by more sensitive interrogating devices, were also issues.

There is so much equipment to move, and some new equipment to buy, that project manager Gilbert Aldaz (4827) considers construction of the new building to be only one-third of the task ahead.

"We have to pull all those accelerators and beam lines, take them out, crate, transport, uncrate, reassemble, and get them up and running," he says. Of particular difficulty will be a 90,000-pound central tandem unit of a high-voltage Van de Graaff accelerator. "The central column is fragile, and it hasn't been moved since the '60s," he says. "It's sensitive to temperature and pressure changes. We'll have to pick the right day, blanket it, and support the column. It'll take special rigging, a truck, and probably a crane to get it into the new building."

Three replacement pieces of equipment will also be installed: a 100 KeV nanoimplanter, a 3 MeV single-ended accelerator, and a new nuclear microprobe.

The list of research targets for the IBL is extensive. It includes research areas uniquely owned by Sandia in the DOE complex, including certification of tritium content in neutron tube targets, microscopic diagnostics of the radiation sensitivity of integrated circuits — simulating the effects of the enormous fluxes of neutrons associated with nuclear detonations — and other calibrations and certifications for the nuclear stockpile.

Other areas of Sandia interest are materials studies that include corrosion rates of electronic components, composition analysis through use of high-energy beams, and materials modification through use of low-energy ion implanters to study and predict the corrosion of materials used in sensitive components.

Money was allocated by Congress partly in recognition of savings in the contingency construction funds for Sandia's MESA project, which was completed $48 million under budget, says Bill Jenkins (8420), a deputy director of the Weapon Engineering Program center.

The building is expected to be completed in 2009 and equipment installed by 2010.

"Barney's been waiting a long time for this building," says Gil. "He's been the driving force."

Right-sized reactor may soon become reality

Sandia seeks industry partner to commercialize device

By Chris Burroughs

A smaller scale, exportable, lifelong proliferation-resistant "right-sized reactor" may be coming soon to a town or military base near you thanks to the efforts of a Sandia research team led by Tom Sanders (6063).

Tom has been collaborating with numerous Sandians on advancing the small reactor concept to an integrated design that incorporates intrinsic safeguards, security, and safety. This opens the way for possible exportation of the reactor to developing countries that do not have the infrastructure to support large power sources. The smaller reactor design decreases the potential of the countries to develop an advanced nuclear regulatory framework.

Incorporated into the design, says team member Gary Rochau (6771), is what is referred to as "nuke-star," an integrated monitoring system that provides the exporters of such technologies a means of assuring the safe, secure, and legitimate use of nuclear technology.

"This small reactor would produce somewhere in the range of 100 to 300 megawatts of thermal power and could supply energy to remote areas and developing countries at lower costs and with a manufacturing turnaround period of two years as opposed to seven for its larger relatives," Tom says. "It could also be a more practical means to implement nuclear base load capacity comparable to natural gas-fired generating stations and with more manageable financial demands than a conventional power plant."

About the size of half of Bldg. 823, where much of Sandia's energy and water research is conducted, a right-sized reactor facility will be considerably smaller than conventional nuclear power plants in the US that typically have a footprint as large as the Labs' Tech Area 1 and produce 3,000 megawatts of power.

With approximately 85 percent of the design efforts completed for the reactor core, Tom and his team are seeking an industry partner through a cooperative research and development agreement (CRADA). The CRADA team will be able to complete the reactor design and enhance the plant side, which is responsible for turning the steam into electricity.

Team member Steve Wright (6771) is doing research using Laboratory Directed Research and Development (LDRD) program funding that is expected to allow the reactor system to operate at efficiencies greater than any current designs, ultimately giving the reactor the greatest return on investment.

"In the past, concerns over nuclear proliferation and waste stymied and eventually brought to a halt nuclear energy R&D in the United States and caused constraints on US supply industries that eventually forced them offshore," Tom says. "Today the prospects of nuclear proliferation, terrorism, global warming, and environmental degradation have resulted in growing recognition that a US-led nuclear power enterprise can prevent proliferation while providing a green source of energy to a developing country."

Tom says developing countries around the world have notified the International Atomic Energy Agency (IAEA) of their intent to enter the nuclear playing field. This technology will provide a large, ready market for properly scaled, affordable power systems. The right-sized nuclear power system is poised to have the right combination of features to meet export requirements, cost considerations, and waste concerns.

The reactor system is built around a small uranium core, submerged in a tank of liquid sodium. The liquid sodium from the tank is piped through the core to carry the heat away to a heat exchanger also submerged in the tank of sodium. In the Sandia system, the reactor heat is transferred to a very efficient supercritical CO_2 turbine to produce electricity.

These smaller reactors would be factory built and mass-assembled, with the potential of producing 50 a year. They would all have the exact same design, allowing for quick licensing and deployment. Mass production will keep the costs down, possibly to as low as $250 million per unit. Just as Henry Ford revolutionized the automobile industry with mass production of automobiles via an assembly line, the team's concept would revolutionize the current nuclear industry, Tom says.

Because the right-sized reactors are breeder reactors — meaning they generate their own fuel as they operate — they are designed to have an extended operational life and only need to be refueled once every couple of decades, which helps alleviate proliferation concerns. The reactor core is replaced as a unit and "in effect is a cartridge core for which any intrusion attempt is easily monitored and detected," Tom says. The reactor system has no need for fuel handling. Conventional nuclear power plants in the US have their reactors refueled once every 18 months.

Tom says much of the reactor technology needed for the smaller fission machines has been demonstrated through 50 years of operating experimental breeder reactors in Idaho. In addition, he says, Sandia is one of a handful of research facilities that has the capability to put together a project of this magnitude. The project would tap into the Labs' expertise in complex systems engineering involving high performance computing systems for advanced modeling and simulations, advanced manufacturing and robotics, and sensors, as well as its experience in moving from research to development to deployment.

"Sandia operates one of three nuclear reactors and the only fuel-critical test facility remaining in the DOE complex," Tom says. "It is the nation's lead laboratory for the development of all radiation-hardened semiconductor components as well as the lead lab for testing these components in extreme radiation environments."

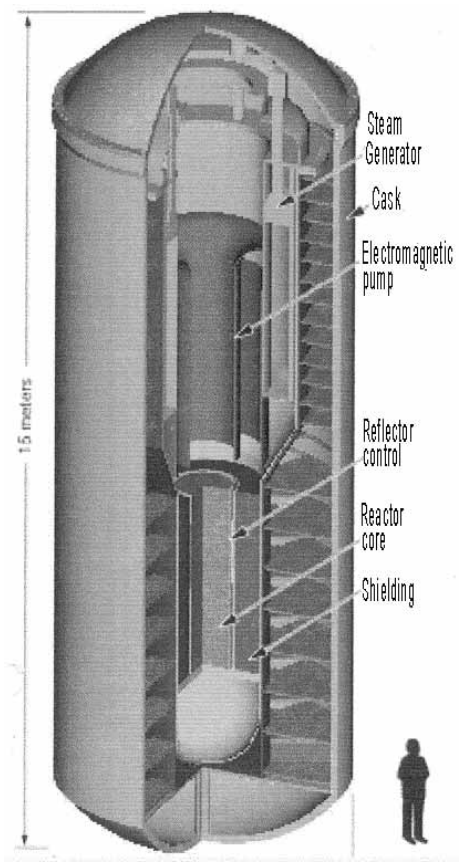
The goal of the right-sized reactors is for them to produce electricity at less than five cents per kilowatt hour, making them economically comparable to gas turbine systems.

Tom says the smaller reactors will probably be built initially to provide power to military bases, both in the US and outside the country.

Right-sized reactor team

Tom Sanders, Mary Lou Garcia (both 6063), Andrew Orrell (6800), Sid Gutierrez (6700), Jennifer Nelson (6060), George Backus (1433), Mark Derzon (17492), Kathy Gaither (6315), Joe Harris (2430), Red Jones (6471), Pat McDaniel (5441), Paul Pickard (6770), Gary Rochau (6771), Larry Shipers (6471), Carol Sumpter (1770), Carla Ulibarri (6414), Steve Wright (6771), Greg Wyss (6414), Les Shephard, (6000), Virginia Cleary (6763)

Right-sized reactor



Tom Sanders president-elect of American Nuclear Society

Tom Sanders, manager of Sandia's Global Nuclear Futures Initiative, is the president-elect of the American Nuclear Society. Currently the organization's vice president, he will officially become president in June.


TOM SANDERS

As the leader of the Global Nuclear Futures vision at the Labs, the 23-year Sandia veteran led the development of topical meetings, policy papers, news articles, partnerships with other countries and non-government organizations, and caucus events on Capitol Hill to articulate that a healthy and thriving US nuclear energy infrastructure is key to global proliferation risk management in the future.

Tom has his BS, MS, and PhD degrees in mechanical/nuclear engineering from the University of Texas in Austin. Besides his work at Sandia, he also served as a nuclear operator and supervisor on US Navy nuclear submarines.

Gigantic 'nanotubes' examined at CINT

By Neal Singer

A carbon nanotube of micrometer dimensions offers the same conceptual challenge as does a jumbo shrimp: How can something so small become large, yet remain in its category?

A relatively huge, lightweight carbon tube with good strength and electrical properties is desirable, all right, because it can be manipulated in the far more accessible micrometer regime.

But is it still a nanotube?

Jianyu Huang (1132) at the Sandia/Los Alamos Center for Integrated Nanotechnologies (CINT), and colleagues elsewhere, got around this problem by naming their new creation "colossal carbon tubes" in a paper published in an October issue of *Physical Review Letters*.

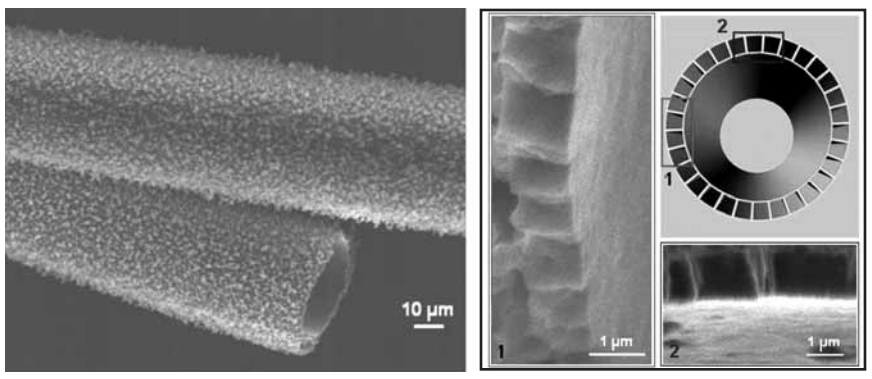
"The structures are remarkable because they are very light, possess good electrical conductivity, and have mechanical properties similar to carbon fibers," Jianyu says.

Among possible uses are so-called textile electronics and body armor.

Because of their strange, surprising sponginess — walls of graphite-like carbon kept apart by hollow, rectangular compartments — the colossal fibrous tubes have a density of 0.1 gram, compared with 2 grams for the comparable amount of carbon fibers.

The colossal tubes are about the same length as carbon fibers — in the centimeter range. And they appear to be slightly stronger — a very desirable, and until now unheard of, property in large carbon tubes.

MIT carbon technology specialist Mildred Dresselhaus was quoted in an online news column of the journal *Nature*: "This is a new form of carbon that was unexpected to me."



SUPERTUBES — Scanning electron microscopy image (left image) of huge carbon tubes with rectangular pore tunnels in the walls. Images at right depict cross-sectional views of the tubes.

Jianyu, who did the microstructure analysis that confirmed that the walls of such tubes consist of graphitic structure, describes the new creation as "a porous, giant, carbon fiber-like tubular structure" of diameters ranging from 40 to 100 micrometers. Conventional carbon nanotubes are about 10 nanometers in diameter.

The material was made at Los Alamos National Laboratory. Researchers there led by Yuntian Zhu and Huisheng Peng found that heating ethylene and paraffin oil produced a carbon vapor that condensed into tubes of pure carbon tens of micrometers wide and up to several centimeters long.

Red rock, blue sky

Sandia Security Police Officer Thelma Holman bridges two worlds

Story by Bill Murphy ***Photos by Randy Montoya***

From a place called "Hua-na-tota" came the ancestors.

With their language and their arts and their gods they came from Hua-na-tota to a canyon rimmed by red rock and watered by a flowing stream and here they built many villages, many fortresses.

The rains came and watered their valley. The corn grew and the people thrived and were strong. In their tongue — in the kivas and around the hearths — in their own Towa tongue they told the stories of the ancestors — and of the time before the ancestors, the time of creation.

The Europeans came and there was peace and then war and finally conquest and a bitter peace and the people were moved from their many ancient villages to the one village, the village they called Walatowa.

That was long ago, 300 years ago. But the people kept their arts; they kept their language. And the European God and the gods of the ancestors dwelled together in the people's hearts, the people of Walatowa, the people of Jemez Pueblo.

A mother and a daughter sit side by side, the good gray clay from the south end of the village on a table between them. Within the clump of clay, dense and wet, are bowls and vases, waiting to be drawn out. With their hands, the mother and daughter shape the bowls. They craft them from the raw clay into things of beauty. They will fire them and paint them and their beauty will lift up the hearts of all who see them, who hold them, who use them.

Thelma Holman (4211) is a member of Sandia's Pro Force. Her mother Juanita Yepa, retired now, for 22 years was a custodian at Sandia. Juanita lives in Jemez Pueblo to this day; Thelma resides in Albuquerque with her husband and son (a daughter just joined the US Marine Corps and will deploy to the Middle East soon.). On pueblo feast days, Thelma comes back to Jemez, back to her roots, back to the home of her mother and father, Johnny.

Under the roof of her parents on this feast day, Thelma sits with her mother. They shape clay bowls and vases, working quickly. They have done this — together — many times, the mother passing on to the daughter everything she has learned. They are comfortable, familiar, family. Mother and daughter. Juanita and Thelma.

The mother, Juanita, is the faster of the two; this isn't a race, but her hands have done this so many times, countless times, over the decades that the shapes emerge fluidly out of the clay.

On this feast day, Nov. 12, Juanita welcomes visitors to her home with posole and red chile and enchiladas and fresh breads and pies. Such pies. Such posole. One is privileged to share this special day among new friends. From the plaza in the village center, one hears the dancers. Many have come to this place this day to see these dances and everyone is welcome.

Thelma talks of many things as her hands shape a wedding vase. She has been making pottery ever since she could remember. Before pottery, there were mud pies and sand castles. Like Thelma, Juanita talks about many things. When one admires her turquoise necklace, heavy with rich sky-blue stones, Juanita explains how she comes by such striking jewelry. When she is set up on the plaza in Santa Fe to sell her work, she'll sometimes admire a piece of jewelry by a neighboring artist. They make a trade, vase for necklace, pot for bracelet.

Juanita talks about the gray clay she's working with and the red clay she sometimes uses. The red clay comes from the north end of the village. The red clay is softer, she says. Thelma agrees, the red clay is softer. It's easier to work with, easier to make smooth, better to paint. And gathering the clay — the red clay and the gray clay — is a family affair. "My brother gets the clay and cleans it for us," Thelma says. In its native state, the clay is full of twigs and leaves and small stones. By the time the women begin to work it into beautiful and useful things, it's smooth and cool and moist, all promise and potential.

Today, Thelma and Juanita are dressed in their feast day garb, bright and colorful, a harmonious, almost musical, link to where they come from, to those who came before.

For colleagues and friends who know Thelma only from the workplace, the contrast is striking. Her work attire, the uniform of a Sandia SPO, firearm included, seems utterly at odds with this traditionally dressed Jemez woman. Thelma concedes that "it's like two different worlds," but takes the differences in stride.

How did she end up in security, one wonders?

"I was one girl among four brothers," Thelma says. "Everything they did, I had to do." So perhaps it was sibling rivalry of a sort that led her to study computer analysis at New Mexico Tech after graduating from high school in 1981. Maybe growing up around so many brothers had something to do with her decision to join the Army Reserve and serve as a National Forest Service firefighter before joining Sandia's security force in 1986.

Making pottery, for Thelma, isn't just about the ends. It's about connections: connections to her family, her village, and even to those who came to this valley hundreds of years ago. "I feel like I'm close to home" when crafting clay into beautiful objects, she says. "I think about my mom, about our culture, about how I grew up."

And there's a spiritual connection. "Whenever I start a new pot, I pray. I ask God to guide me."

Outdoors now, the autumn sun shines down on mother and daughter and plays off the red rocks at the north end of the village. The light bounces off the impossibly red walls and fills the valley. Traffic on the road to Jemez Springs slows at this place; the passengers in the cars, from Illinois, Missouri, Tennessee, have never seen such sights — such colors, such sun, such sky.

Thelma and Juanita in their feast day garb in the shimmering light are holding some of their favorite works: A brightly painted drum, a wedding vase, a brilliantly painted pot that fills two arms. One looks across the valley to the far cliffs and sees no roads, no houses, no poles or wires. Just earth and sky.

One thinks of the mothers and daughters, the fathers and sons, the families and clans who came here before. One thinks back to those first dwellers here who came from Hua-na-tota. Who came here to Walatowa, which means, in the Jemez language, the unique Towa tongue, "This is the place."

THELMA HOLMAN, above left, and her mother, Juanita Yepa, standing before the red rocks at the north end of Jemez Pueblo, display some of their favorite works. Juanita holds a wedding vase and a painted drum (made by a friend), which she plays when she sings at her church. Thelma holds a pot that was two years in the making. In other photos, Thelma and her mother craft beautiful objects from the gray clay that is found at the south end of Jemez Pueblo. In the photo at the lower left, Thelma and Juanita pose in front of Juanita's home on Nov. 12, one of two feast days the pueblo observes each year. Joining the two is Juanita's dog, Trooper.

Dental Care Plan for nonrepresented employees

Delta Dental PPO point-of-service administered by Delta Dental

Note: The information here regarding Sandia's dental plan coverage has been provided by Delta Dental to help answer questions about the provider networks available under Dental Care Plan. Although the in-network dentist choices have not changed — they are the same ones that were available under the prior Dental Expense or Dental Deluxe plans — the change to Dental Care Plan is an opportunity to learn more about how using in-network providers benefits you.

Benefit Period – Jan. 1, 2009, through Dec. 31, 2009	Delta Dental PPO Dentist		Delta Dental Premier Dentist Non-Participating Dentist	
Benefit Schedule:	**The Plan Pays**	**You Pay**	**The Plan Pays**	**You Pay**
Diagnostic and Preventive Services				
• Oral Examinations – twice in a calendar year	100%	0%	100 %	0%
• Routine Cleanings – twice in a calendar year	100%	0%	100 %	0%
• X-rays – full mouth series once every 3 years/Bitewings – twice in a calendar year	100%	0%	100 %	0%
• Fluoride Application – under age 18, twice in a calendar year	100%	0%	100 %	0%
• Emergency Treatment – for relief of pain	100%	0%	100 %	0%
• Sealants – under age 14, permanent molars only, 3 year limitation	100%	0%	100 %	0%
• Space Maintainers – under age 19	100%	0%	100 %	0%
Basic and Restorative Services				
• Amalgam fillings – anterior and posterior teeth	80%	20%	80%	20%
• Composite resin fillings – anterior teeth only	80%	20%	80%	20%
• Stainless steel crowns	80%	20%	80%	20%
• Extractions – non-surgical	80%	20%	80%	20%
• Oral Surgery – maxillofacial surgical procedures of the oral cavity, including surgical extractions	80%	20%	80%	20%
• Endodontics – pulp therapy and root canal filling	80%	20%	80%	20%
• Periodontal Cleanings	80%	20%	80%	20%
• Periodontics – non-surgical and surgical	80%	20%	80%	20%
• Occlusal Guards	80%	20%	80%	20%
• General Anesthesia - intravenous sedation and general anesthesia, when dentally necessary and administered by a licensed provider for a covered oral surgery procedure	80%	20%	80%	20%
Major Services				
• Crowns, Cast Restorations, and Inlays, including repairs - when teeth cannot be restored with amalgam or composite resin restorations	50%	50%	50%	50%
• Prosthodontics – procedures for construction or repair of fixed bridges, partials or complete dentures	50%	50%	50%	50%
• Implants – specified services, including repairs, and related prosthodontics, subject to clinical review/approval	50%	50%	50%	50%
Orthodontic Services (all ages)				
• Procedures performed by a dentist using appliances to treat poor alignment of teeth and their surrounding structure	50%	50%	50%	50%

Maximum benefit amount up to — $1,500 per plan participant per benefit period. The plan's payment for orthodontic services will not exceed a lifetime maximum of $1,800 per plan participant.

Deductible — $50 per plan participant per benefit period limited to a maximum deductible of $150 per family per benefit period. The deductible does not apply to diagnostic and preventive services.

This benefits overview is being provided by Delta Dental for illustration purposes only. While accurate, it does not imply coverage and is intended only to highlight Dental Care Plan benefit levels. It does not reflect all limitations, coordination of benefits, and other important plan provisions, or provide complete coverage information. A summary of benefits, which may be formatted differently, is part of the Dental Care Plan Summary Plan Description.

Ask your dentist for a predetermination of benefits any time more costly procedures are anticipated. When requested by a dental provider, an advance estimate of benefits payable can be provided by Delta Dental before dental care services are received. Predetermination is strongly recommended and there is no charge for this service.

Dental Care Plan: One plan or two?

Dental Care Plan is a single dental plan with two In-Network Delta Dental provider network options: Delta Dental Premier and Delta Dental PPO. Delta Dental Premier is the country's most extensive panel of dentists, with more than 186,000 locations across the country. Delta Dental PPO is a second, somewhat smaller (108,000 locations nationally) network in which participating dentists agree to deeper discounts.

Because Dental Care Plan offers both network choices, anytime services are received from a dentist who participates in both Delta Dental PPO and Delta Dental Premier, the total cost of the services received will reflect the lower Delta Dental PPO maximum approved fees. You may select a Delta Dental PPO dentist, whenever possible, to reduce the patient out-of-pocket costs, which are a percentage of the dentist's approved fee. Benefit levels are the same for nonparticipating providers but out-of-pocket costs will typically be higher if services are received from a dentist who does not participate in one of the Delta Dental provider networks.

• Delta Dental dentists will not bill a Delta Dental patient for any amount over the Delta Dental maximum approved fee applicable to the service provided and his or her provider agreement with Delta Dental. Members are protected from unexpected "balance bill" charges.

• Participating dentists have agreed to bill Delta Dental, avoiding the need for Delta Dental members to pay first and wait for reimbursement. For covered services, subscribers are initially responsible only for coinsurance and deductibles, if any.

• Delta Dental dentists agree to fee maximums for both covered and noncovered services. This can be an important benefit because members are responsible for full payment of noncovered services. If noncovered services are needed, and the cost of that care is reduced, members save money.

• Members have direct access to Delta Dental dentists. Availability and appointment scheduling is always independently determined by each individual dentist, not by Delta Dental.

• Preselection of a dentist is never required. Each member of the family may use a different dentist.

Some dentists participate only in Delta Dental Premier; others participate in both networks

Some dentists — particularly some types of specialists — may be unlikely to participate in a network that requires them to reduce their fees beyond a certain point. Other dentists — ones who participate in both Delta Dental PPO and Delta Dental Premier — have structured their practices so they can see both types of patients (those with Delta Dental PPO plans and those with Delta Dental Premier plans). For these dentists, it is usually about balance. Delta Dental PPO fees are less, and they know some of their patients will have Delta Dental PPO plans. They know these people might not be patients at all if they weren't enrolled in an affordable Delta Dental PPO plan. These dentists also know that some of their patients will be on plans that feature Delta Dental Premier — plans that allow somewhat higher fees.

Dentists who participate in both networks like the increased patient volume they get because they accept Delta Dental PPO but they also rely on the employers who select Delta Dental Premier plans — a combination that helps a dentist create a patient flow/revenue balance. Dental Care Plan is unique because it features both networks, giving plan participants the opportunity to consider both access and the cost of care — the most freedom possible to choose the best dentist for their own needs, every time.

Nonparticipating providers

Nonparticipating dentists are dentists who do not participate in any Delta Dental dentist network. Benefits apply for covered services received from a nonparticipating dentist, however:

• These dentists are not subject to agreements that would require them to honor Delta Dental pricing maximums for both covered and noncovered services;

• Nonparticipating dentists are not subject to other member protections, such as guarantees on restorative services, which are required of dentists who participate with Delta Dental;

• Payments made by Delta Dental for services received from a nonparticipating

(Continued on next page)

Delta Dental Plan

(Continued from preceding page)

provider may be paid to the provider or directly to the enrolled subscriber, depending on the state in which the services were received and whether there was a valid assignment of benefits. Subscribers may be responsible for payment at the time services are received for the full amount due if required by the nonparticipating provider.

Maximize benefits by selecting, whenever possible, an in-network Delta Dental dentist.

Tooth implants

Dental Care Plan includes coverage for specified (Endosteal) implant services. If you are considering an implant, ask your dentist for a predetermination, which is a pretreatment estimate to help determine your out-of-pocket cost. Predetermination is recommended, but not required, under DCP.

Ongoing orthodontic treatment

If you have a family member who reached the lifetime ortho maximum under the former Dental Expense Plan, and that family member is still undergoing ortho treatment, additional benefits may apply under DCP. Call 1-800-264-2818 for more information.

Confronting the burden of dental disease

The Centers for Disease Control estimates that 90 percent of all Americans over the age of 40 have experienced tooth decay. In addition, gum disease, oral cancer, and other dental problems make it apparent that oral health issues impact almost everyone at some time in their lives. Although Americans made about 500 million visits to dentists and an estimated $98.6 billion was spent on dental services in 2007, many children and adults still go without affordable access to dental care, which creates burdens on individuals, their employers, and the health care system. Dental benefits have proven to be one of the best ways to provide access to dental care because individuals with dental coverage seek care more often, and are less likely to have unmet dental needs than those without coverage.

More than a healthy mouth

Researchers are also finding associations between oral health and the incidence, diagnosis, and management of other systemic conditions. Sometimes the early signs of a disease are visible to dentists. The burden oral diseases place on the population could be greatly reduced, or even eliminated, with appropriate access to dental care, a focus on oral disease prevention, and continued scientific research.

Beyond the smile

Better oral health also has an impact in the workplace. The US Surgeon General reports that more than 164 million work hours and 51 million school hours are lost each year due to oral health issues. These figures do not account for loss of school and work hours due to other chronic problems such as diabetes, which may be linked to oral disease.

Searching for a dentist?

To locate a dentist by provider network (Delta Dental PPO or Delta Dental Premier) or search for one by location or specialty, click Consumer Toolkits at www.toolkitsonline.com, where you'll also find valuable website resources.

Sealants covered under DCP

DCP covers sealants for enrolled children under age 14. Coverage for fluoride application is also available, twice in a calendar year, for kids under age 18. If you have not taken advantage of these important preventive care services, talk to your dentist today about the advantages.

* * *

Delta Dental Customer Service (800) 264-2818 or customerservicemail@deltadentalmi.com

New Year reminders from Benefits

New UHC and CIGNA identification (ID) cards coming in January 2009

Due to changes in the 2009 copay structure for UnitedHealthcare Standard and Premier PPO plans, and CIGNA in-network (non-union only) all enrolled members (active employees, non-Medicare and Medicare retirees) will receive new identification card(s). The cards will be mailed to members' homes. When you receive this mailing, destroy the old card(s) and replace with the new ones. Union represented members will not receive new cards.

Annual coordination of benefits

Be sure to contact your respective health care vendor (UHC, CIGNA, or Kaiser) for coordination of benefits for 2009. Call the toll-free number on the back of your ID card.

Catalyst Rx

CIGNA members will receive new Catalyst Rx cards in December for use at retail pharmacies.

Mail Order: if you want to order your prescription(s) through the mail order program, you need to register first with Catalyst via telephone; once that is complete, you must call in for your first refill.

Specialty Drug Management Program

All specialty prescriptions for UHC and CIGNA members will be limited to a 30-day supply. If you are currently taking a specialty drug, you will be contacted by a Walgreens/MedMark Specialty Care team member by Dec. 15 to assist in the transition of your prescription to prevent any disruption in your medication therapy. You may want to contact them directly at 866-823-2712 rather than wait for their outreach call.

Flexible Spending Accounts (FSA)

PayFlex debit cards: Employees new to an FSA account in 2009 should expect to receive PayFlex debit cards the last week of December. Remember to save all your receipts because some debit card purchases require substantiation, which is done quarterly. Additional spouse cards can be requested at www.mypayflex.com.Employees re-enrolling in a PayFlex account in 2009 will not receive new PayFlex debit cards, but will have the 2009 election loaded on the card on Jan. 1, 2009.

PayFlex go green tip: Remember to set up a MyPayFlex account, enroll in Direct Deposit, and mark that you want eNotify under My Info. This will create a green account and all payments and correspondence will be paperless!

Delta Dental

At Sandia's request, Delta Dental will begin issuing ID cards to all primary dental plan members. The cards will include the primary member name, group name, group number, and claim filing address. For purposes of account inquiries, the identification number is still the primary member's Social Security number. The Social Security number will not be included on the cards. Additional cards can be printed through toolkitsonline.com (once there, select the Consumer Toolkit link) or by request from Delta Dental customer service at 1-800-264-2818.

Sandians honored by Lions Club for eyeglasses donation drive

The Albuquerque Breakfast Lions Club has recognized two Sandians for their efforts in collecting eyeglasses around Sandia. The two, Catheryn Robertson (4242), left in the photo above, and Vanessa Archuleta (4234), organized the eyeglasses recycling effort under the sponsorship of the Sandia Office Professionals' Quality Council. Vanessa is chair of the council and Catheryn heads up the group's community outreach efforts.

Over the course of the several months of the recycling program, more than 800 pairs of eyeglasses were donated, some new or nearly so and some that were vintage glasses.

Vanessa and Catheryn were tapped for the recognition by Tony Bryce (2431), a member of the Lions Club. They were presented plaques from the club.

The Lions Club has a long association with sight-related issues, raising money to provide eye exams for the disadvantaged, conducting eye tissue donation enrollments, and sponsoring eyeglasses recycling programs. Helen Keller gave the Lions its mission as "Knight of the Blind."

Says Tony, "These eyeglasses will be sent to a Lions Club facility where they will be cleaned, repaired, and catalogued for distribution around the world by the Lions Club International."

Recent Retirees

Terry Bisbee
40 6430

Joe Martinez
40 4810

Karl Wiegandt
40 9500

Bob Blewer
39 1000

Gary Schuster
39 1711

Ron Tucker
39 5416

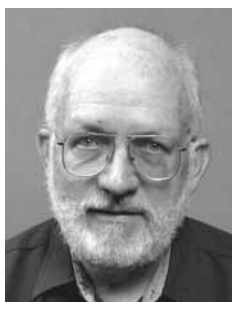
Charles Adams
35 1523

Richard Sanderville
34 3653

Al Villareal
31 4113

Linda Gibson
25 2995

Randy Schmitt
25 1128



Richard Bild
30 12870

Dennis Martin
27 1711

David Schulze
25 1521

Justine McNabb
20 5901

Richard Conaway
14 10500

David Thomson
20 1649

Scott Hutchinson
15 5349

Mileposts

New Mexico photos by Michelle Fleming

Feedback

Work for Others process described; Is there still a student 'pipeline?'

Q: *We hear a lot of talk about efficiency of operations throughout the Labs, and there have been improvements, but there are many areas where things still need to get better. For example, it takes months to bring money into the Labs through the WFO (Work for Others) process. What will be done to make this faster and easier?*

A: The WFO/CRADA Agreements Department maintains detailed metrics for the entire WFO proposal/agreement process. In FY07, the total Other Federal Agency (OFA) process time averaged 75 days, broken out by steps as follows:

Step	Days	Process
1	25	Project manager/support staff initiates proposal in eWFO, proposal is approved and distributed electronically to sponsor and DOE/NNSA/SSO.
2	38	Sponsor receives Sandia proposal and submits Interagency Agreement/Funding Document (IA/FD) to DOE/NNSA/SSO.
3	12	WFO/CRADA Agreements Dept. processes the IA/FD through DOE/NNSA/SSO (multiple steps including funds certification by NNSA Service Center, and SSO Program Office and Contracting Officer approval) and funds applied to Oracle project to authorize start work.

Step 1, preparing the proposal, is the second most time-consuming step, and one that can be controlled by Sandia, unlike the time required for a sponsor to submit funding. Although Sandia leads the DOE complex with our electronic proposal processing and approval system — eWFO — ensuring that Sandia project managers and administrative and financial support staff are trained and knowledgeable about the WFO program and the eWFO system is instrumental in decreasing the proposal generation time. In FY07, the WFO/CRADA Agreements Department, the WFO Finance Department, and the Sandia Business School (SBS) teamed to develop a comprehensive suite of courses covering WFO proposal/agreement/financial policies, processes, and procedures for both project managers and administrative and financial support staff.

In addition, the WFO/CRADA Agreements Department published an online WFO manual, complete with links to contact subject-matter experts, description of DOE policy and requirements documents, access to forms, description of eWFO functionality, etc. Reducing the proposal generation time at Sandia will greatly impact the overall processing time by providing the sponsor with the proposal Statement of Work quicker.

Step 2, in which the sponsoring agency provides agreement/funds, takes the greatest amount of time in the process. Many factors can impact this metric, but our experience shows the sponsor spends the greatest amount of time complying with requirements imposed by the Economy Act, including preparing a Federal Acquisition Regulation-required Determinations & Findings certification. This is a comprehensive and time-consuming process by design to ensure noncompetition with industry. However, Sandia project managers and their business support personnel can sometimes shorten the time to process through effective communication, by providing instructions to sponsors in advance on "How to Do Business with Sandia" and DOE administrative instructions, or by contacting the WFO/CRADA agreements specialists for early intervention with the sponsor's contracting office.

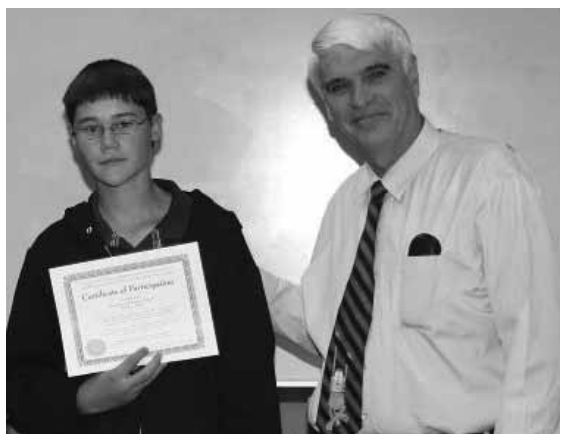
The last step in the process, agreement/funds processing and approval by DOE/NNSA, takes the least amount of time. However, Sandia has engaged with other NNSA laboratories to propose significant changes in this process to DOE/NNSA, including delegation of approval to the laboratories to certify funds and execute OFA agreements. Since these changes would require modification to DOE policies, many issues must be acted on by DOE and NNSA, and this is viewed as a long-term initiative.

The WFO/CRADA Agreements Department encourages project managers and support staff to attend SBS WFO training and to use the comprehensive information contained in the WFO manual. We strive to support the WFO program at Sandia as best we can, given available resources and DOE/NNSA requirement constraints. *— Deborah Payne (10012)*

Q: *With all the hiring changes we're hearing about — LTEs, staff aug workers, etc. — what is happening with student interns and the so-called "pipeline"? I know of a person who just finished a master's degree. My department would like to create a position but can't because of FTE level restrictions, although there is adequate funding. With 25 percent of the workforce retirement-eligible, why isn't Sandia focusing on the younger generation, especially those who are already trained, have a degree, and work experience at Sandia?*

A: The student pipeline absolutely exists and we have had outstanding conversion rates for a number of years. Sandia tracks graduation dates and strives to hire top students who have participated in our intern programs as well as others coming off campus. This year we have tried to focus on increasing the number of off-campus hires (three years or less off campus) brought into the laboratories. The current environment of constrained federal budgets, rising costs of doing business, and a transforming nuclear weapons complex has caused many organizations to become more conservative in their hiring plans. Sandia is no exception. We will, however, continue to assess the effectiveness of our Student Intern Programs and strive to provide a robust student pipeline for Sandia. *— Karen Gillings (3500)*

Essay winners honored



SID GUTIERREZ (6700) presents Rhett Trappman from Los Lunas High School, one of 10 winners, with a US Savings Bond for his entry in a drawing and essay contest sponsored by the Albuquerque ACTSO (Academic, Cultural, Technology, and Scientific Olympics) Team America Rocketry Challenge. Essay topics were: life as an astronaut, plans for a lunar colony, and transportation 50 years from now. Sid, a former astronaut, talked to the students about liftoff and living conditions, and gave a description of space. He encouraged students to pursue their dreams, telling them that he knew he was going to be an astronaut when he was in 5th grade.

Shoes for Kids

Program born in Sandia's Military Liaison Department

VERY FITTING — Youngsters from Emerson Elementary School in Albuquerque gather around Community Involvement Shoes for Kids program lead Patti Zamora to talk about their new shoe options. In the photo at lower right, Community Involvement team member Tally Lobato helps a student find a proper fit. This year, Shoes for Kids worked with a new corporate partner, the Shoe Dept.

Photos by Randy Montoya • Story by Iris Aboytes

A school bus full of children arrives at The Shoe Dept. store on Cutler Ave. in Albuquerque. Sheer excitement fills the air as each child steps off the bus. Little girls giggle and little boys poke fun. There is nothing unusual about these children except for the fact that they are in need of shoes and their parents can't afford them.

The students are getting new shoes courtesy of Sandia's yearly Shoes for Kids program. It was more than 50 years ago that Sandia scientists decided to pool their money and buy shoes for needy children instead of exchanging Christmas cards and gifts.

"My wife Chris and I would have a family that had 11 children over for Christmas every year," says 94-year old retiree John Haaland.

"We noticed that the shoes they wore were the two-for-five special, two pairs for $5," says Chris. "They were the kind that the soles looked like cardboard. The shoes were gone once they got wet."

John's experience with the family and the numerous newspaper articles about students needing shoes convinced him and his colleagues in what is now Sandia's Military Liaison group to help the young students.

"Everyone was very enthusiastic about our idea," says John. "Retiree Al Hachigan knew the principal of one of the South Valley schools, so we started there."

"The first year we bought 15-30 pair of shoes," says Al.

Word spread through the years, and more and more Sandians became involved. Today about 500 needy students from 21 schools benefit from Sandia's Shoes for Kids Program.

Fittings begin in early November and continue until mid-February. Community Involvement (3652) administers the program. Sandians are welcome to help the children find their special shoe.

Some of the students are shy; others are willing to tell you their life story. Many leave you with lasting impressions. The little girl with beautiful red braids, her face peppered with freckles, did not want a sneaker. She wanted a Cinderella-type slipper. It took her teacher to convince her she needed to get a school shoe to last through the winter.

There was also the little boy whose face was one big smile. His eyes lit up with excitement when it was his turn to find a pair of shoes. Trying to figure out what size he wore was a mystery. The shoes he wore stayed on his feet by sheer determination. Straps of leather partially covered his feet. Another little boy wore shoes that were three sizes too big.

Three siblings hung out together. It was the older brother who advised his little sister and brother on what type of shoes they should select. He was very matter-of-fact in saying his siblings did not have very good eating habits; that is why they had the shiny silver in their mouths.

One little girl came to the shoe fitting feeling sad, according to her teachers. She had wanted her best friend to come too. She wanted her friend to get new shoes.

Sandians who have come to the shoe fittings to help kids find the right shoes say the experience is very humbling. The children don't realize they are there because they are needy, they just know they are getting new shoes. Shoes fitted, they get back on the bus carrying their shoes with grins from ear to ear.

For more information on Sandia's Shoes for Kids Program go to http://www-irn.sandia.gov/org/div12000/ctr12600/shoes/schools.htm.

And so it goes. It was in a world of scientists working with atoms where Sandia's Shoes for Kids program was born. That initial explosion has continued to make certain needy children have shoes to keep their feet warm year after year.